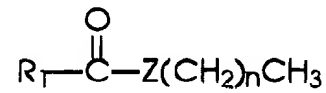
Application No. 09/772,617

REMARKS

Claims 1 to 19 and 44 to 66 are pending in the application. The Examiner has subjected the claims to a restriction requirement and claims 10 to 19 and 44 to 66 have been withdrawn from consideration. Claims 1 to 5, 8, and 9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Mayer et al. (U.S. Patent 4,647,675) and German Patent Publication DE 2452870 (Schein). Claims 1 to 9 stand rejected under 35 U.S.C. §112, first paragraph, as containing subject matter that was not described in the specification in such a way as reasonably to convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 1 stands rejected under 35 U.S.C. §112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. Claims 1, 3, and 4 have been objected to for informalities.

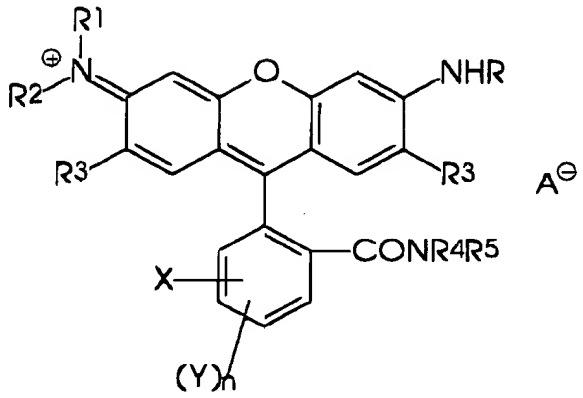
Applicants respectfully traverse the rejection of claims 1 to 5, 8, and 9 under §103. The present invention is directed to a compound having the formula



wherein R_1, Z, and the carbonyl can be comprised by a common ring, wherein R_1 comprises a chromophore that absorbs light from the visible wavelength range, wherein the segment Z comprises one or more of C, O, N, and S, and wherein n is an integer that is at least 17. Advantages of the present invention include substantial hydrophobic character, solubility in materials used as carriers for phase change inks, and other

advantages as set forth in the specification and illustrated in the examples.

Mayer et al. discloses compounds of the general formula



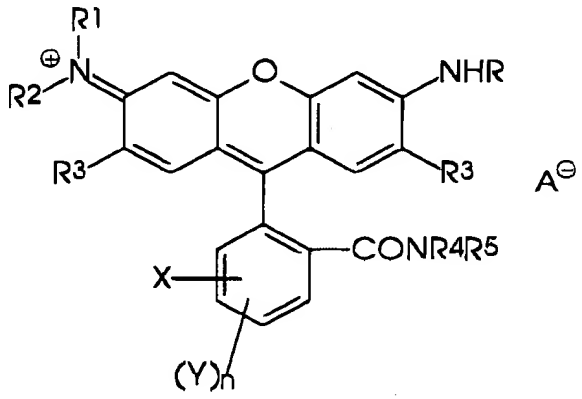
where A^- is an anion, R is hydrogen or unsubstituted or substituted alkyl or cycloalkyl, R^1 and R^2 independently of one another are each hydrogen or unsubstituted or substituted alkyl or cycloalkyl, or one of the radicals may furthermore be aryl, or R^1 and R^2, together with the nitrogen atom, form a saturated heterocyclic structure, the radicals R^3 independently of one another are each hydrogen or C_1-C_4-alkyl, R^4 and R^5 independently of one another are each unsubstituted or substituted alkyl or cycloalkyl, or one of the radicals may furthermore be hydrogen, aryl, or hetaryl, R^4 and R^5, together with the nitrogen atom, form a saturated heterocyclic structure, n is 1, 2, or 3, X is hydrogen, chlorine, bromine, C_1-C_4-alkyl, C_1-C_4-alkoxy, or nitro and Y is hydrogen or chlorine. The compounds are particularly useful for dyeing paper stocks.

The Examiner has stated that this reference teaches xanthene compounds for use in dyeing paper stocks, and that

Applicants disclose xanthene compounds for use as colorants, that Mayer et al. teaches compounds that are similar to Applicants' compounds in column 1, lines 1 to 35 and the abstract, that Mayer et al. teaches compounds that are similar to Applicants' compounds when, in the instant compounds of claim 8, R_3, R_4, R_5, and R_6 are selected from the group consisting of hydrogen and carbon containing materials and can be the same as or different from one another, Z is nitrogen, and R_{80} to R_{88} are selected from the group consisting of hydrogen and alkyl. The Examiner has also stated that Applicants disclose a genus that embraces the compounds of Mayer et al. at column 1, lines 1 to 35 and 36 to 58, that Mayer et al. teaches species which are homologs of Applicants' compounds at column 5, lines 20 to 60, that Applicants disclose that in the compound of claim 8, n is at least 12, meaning that the alkyl chain consists of at least 13 methyl groups, that in column 5, lines 20 to 60, Mayer et al. teaches examples wherein R^2 consists of alkyl groups of various chain lengths, none of which are alkyl chains of at least 13 methyl groups, and that Mayer et al. teaches a tautomer of Applicants' compounds at the formula in column 1 wherein the xanthene contains a positively charged nitrogen substituent. The Examiner has also pointed out that in column 1, lines 36 and 37, Mayer et al. generically teaches that R^2 can be C_1 to C_{13} alkyl. The Examiner is of the position that to those skilled in the chemical art, one homolog is not such an advance over adjacent members of series as requires invention because chemists knowing properties of one member of the series would in general know what to expect in adjacent members, and that the instant claimed compounds would have been obvious because one skilled in the art

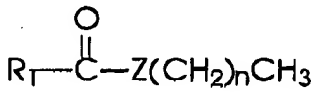
would have been motivated to prepare homologs of the compounds taught in Mayer et al. with the expectation of obtaining compounds which could be used in colorants, that the instant claimed compounds would have been suggested to one skilled in the art, and that one would be motivated to prepare compounds under the genus of Mayer et al. and tautomers of the compounds of Mayer et al. in the expectation that all compounds under the genus and those that are similar in structure would be useful in colorants.

Applicants disagree with this position. The pigments in Mayer et al. are of the formula



wherein R^4 and R^5 independently of one another are each unsubstituted or substituted alkyl or cycloalkyl, or one of the radicals may furthermore be hydrogen, aryl, or hetaryl, and wherein R^4 and R^5, together with the nitrogen atom, may form a saturated heterocyclic structure. At columns 1 and 2, the reference states that R, R^1, and R^2 can be, for example, C_1 to C_{13} alkyl which may furthermore be substituted by hydroxyl, C_1 to C_{13} alkoxy, chlorine, cyano, phenyl, tolyl, chlorophenyl, or methoxyphenyl, and may be interrupted by oxygen and C_1 to C_4 alkylsubstituted

cycloalkyl; R^4 and R^5 can be the radicals stated for R^1 and R^2 and can further be some specific nitrogen-containing radicals. Nothing in this reference teaches or suggests that a chromophore having attached thereto a linear alkyl chain having at least 18 carbon atoms would be desirable, and one of ordinary skill in the art, upon reviewing the teachings of this reference, would not be motivated to attempt to modify the Mayer et al. molecule to arrive at a compound within the scope of the present invention. The colorants of the present invention are of the formula



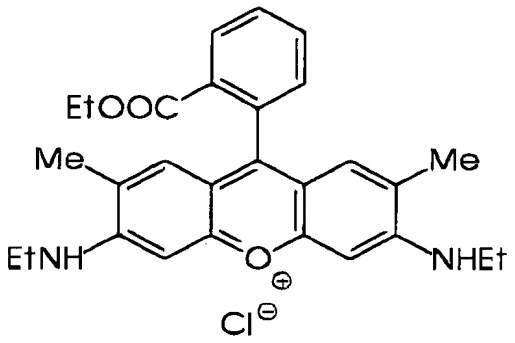
wherein R_1 comprises a chromophore that absorbs light from the visible wavelength range, Z comprises one or more of C, O, N, and S, and n is an integer that is at least 17. The long alkyl chain attached to the Z group helps to enhance the particular suitability of this colorant for use in phase change inks. Since nothing in Mayer et al. teaches or suggests to one of ordinary skill in the art the desirability or usefulness of compositions according to the formula recited in present claim 1, Applicants are of the position that the present invention as recited in claims 1 to 5, 8, and 9 is patentable with respect to the teachings of this reference.

The Schein German patent publication cited by the Examiner is a German equivalent of U.S. Patent 3,922,232. Applicants, when discussing this reference, will refer to the U.S. Patent as well as to the abstract provided by the Examiner. Schein discloses improved fluorescent pigments which are particularly useful for coloring thermoplastics. The matrix or carrier resin for the fluorescent dyes

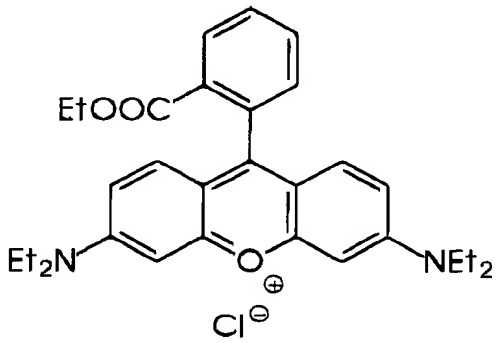
comprises resinous precondensates which are soluble in dimethylformamide and are derived from certain polyfunctional acids and alcohols, and preferably from phthalic anhydride or its esters and pentaerythritol or tris-(2-hydroxyethyl)isocyanurate. Examples of suitable dyes include Maxilon Brilliant Flavine 10GFF, Rhodamine 6GDN Extra, and Rhodamine F3B. The abstract provided by the Examiner indicates the following CAS numbers and structures for these dyes:

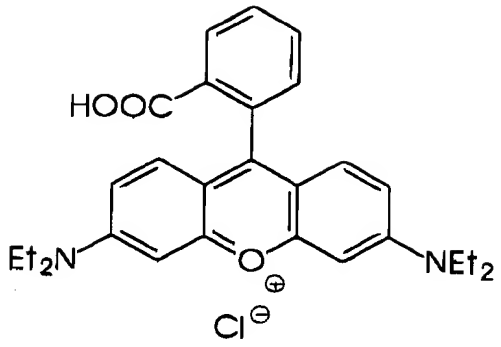
Maxilon Brilliant Flavine 10GFF: CAS 12221-86-2: (no structure provided)

Rhodamine 6GDN Extra: CAS 989-38-8:



Rhodamine F3B: CAS 2390-63-8, 81-88-9:

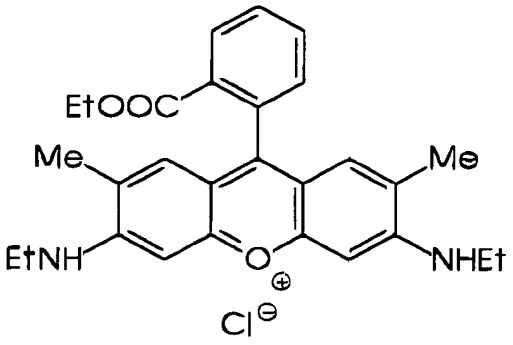




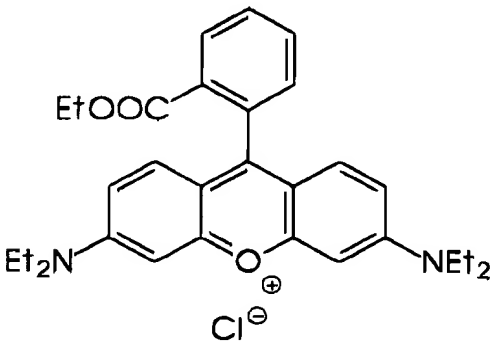
The Examiner has stated that this reference teaches xanthene compounds for use as colorants and Applicants disclose xanthene compounds for use as colorants, that Schein teaches compounds that are similar to Applicants' compounds when, in the compounds of instant claim 8, R_3, R_4, R_5, and R_6 are selected from the group consisting of hydrogen and carbon containing materials and can be the same as or different from one another, Z is oxygen, and R_{80} to R_{88} are selected from the group consisting of hydrogen and alkyl. The Examiner has also stated that Schein teaches a homolog of the instant compounds, that Applicants disclose that in the compound of claim 8, n is at least 12, meaning that the alkyl chain consists of at least 13 methyl groups, and that the compound of Schein differs from Applicants' compounds because Schein teaches an alkyl group in a corresponding position which consists of only two methyl groups (ethyl). The Examiner is of the position that to those skilled in the chemical art, one homolog is not such an advance over adjacent members of series as requires invention because chemists knowing properties of one member of the series would in general know what to expect in adjacent members, and that the instant claimed compounds would have been obvious because

one skilled in the art would have been motivated to prepare homologs of the compounds taught in Schein with the expectation of obtaining compounds which could be used in colorants, that the instant claimed compounds would have been suggested to one skilled in the art.

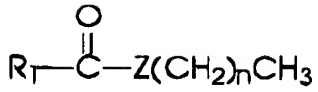
Applicants disagree with this position. Schein discloses fluorescent pigments comprising a resin and a fluorescent dye. The fluorescent pigments are particularly useful for coloring thermoplastics. Structures of some of the suitable dyes include



and



The colorants of the present invention are of the formula



wherein R_1 comprises a chromophore that absorbs light from the visible wavelength range, Z comprises one or more of C, O, N, and S, and n is an integer that is at least 17. The colorants of the present invention are desirably soluble in phase change ink carriers. Nothing in Schein teaches or suggests to one of ordinary skill in the art that a chromophore containing a long alkyl chain of at least about 18 carbon atoms would be desirable, and one of ordinary skill in the art, upon reviewing the teachings of this reference, would not be motivated to attempt to modify the Schein molecule to arrive at a compound within the scope of the present invention. Further, the dyes used in Schein are known, commercially available colorants. Nothing in Schein teaches or suggests a method for forming a colorant within the scope of the present invention. As the courts have long held, a reference must be enabling so that it places the public in possession of that which it is alleged to teach; even if a reference actually names a compound, it does not meet the requirements of a reference if it does not enable one of ordinary skill in the art to make the compound. See, e.g., Reading & Bates Construction Co. v. Baker Energy Resources Corp., 748 F.2d 645, 223 U.S.P.Q. 1168 (Fed. Cir.1984); In re Donohue, 766 F.2d 531, 226 U.S.P.Q. 619 (Fed. Cir. 1985); In re Wilder, 429 F.2d 447, 166 U.S.P.Q. 545 (1970); In re LeGrice, 301 F.2d 929, 133 U.S.P.Q. 365 (C.C.P.A. 1962); In re Hoeksema, 399 F.2d 269, 158 U.S.P.Q. 596 (C.C.P.A. 1968); In re Collins, 462 F.2d 538, 174 U.S.P.Q. 333 (C.C.P.A. 1972); In re Samour, 571 F.2d 559, 197 U.S.P.Q. 1 (C.C.P.A. 1978); In re Sasse, 629 F.2d 675, 207 U.S.P.Q. 107 (C.C.P.A. 1980);

In re Borst, 345 F.2d 851, 145 U.S.P.Q. 554 (C.C.P.A. 1965), cert. denied, 382 U.S. 973, 83 S. Ct. 537, 15 L. Ed. 2d 465 (1966). Accordingly, Applicants are of the position that the present invention as recited in claims 1 to 5, 8, and 9 are patentable with respect to the teachings of this reference.

Regarding the rejection of claims 1 to 9 under §112, first paragraph, the Examiner has stated that the term "chromophore" in claim 1, line 3, is not defined in the specification so as to ascertain the structures of the compounds that are included and/or excluded by the term, and that the specification therefore failed to provide adequate support for claims 1 to 9 as written. Further, regarding the rejection of claim 1 under §112, second paragraph, the Examiner has stated that "this claim is an omnibus type claim."

Applicants disagree with this position. The term "chromophore" is extremely well known in the colorant art. Claim 1 encompasses compounds wherein R_1 comprises any chromophore that absorbs light from the visible wavelength range. One of ordinary skill in the art would understand, in view of the instant specification, that the invention recited in claim 1 encompasses compounds wherein R comprises chromophores including, but not limited to, the specific examples of chromophores provided, and that compounds wherein R comprises any other chromophore that absorbs light from the visible wavelength range are also within the scope of the present invention. The law is clear that the legal teaching of a specification is its teaching to a skilled and prior-art-knowledgeable artisan, not a layman or examiner, and the specification is not merely read literally (per se) or in a vacuum. As stated by the Federal Circuit in Case v. CPC International,

Inc., 730 F.2d 745, 221 U.S.P.Q. 196 at 201 (Fed. Cir. 1984), "35 U.S.C. §112 does not require a specific teaching of that which is already known to one of ordinary skill". As emphasized by the CCPA in 1981 in In re Lang, 644 F.2d 856, 209 U.S.P.Q. 288 at 294, the specification disclosure "must be read in light of the knowledge possessed by those skilled in the art, and that knowledge can be established . . . by reference to patents and publications available to the public prior to appellant's filing date (or by factual affidavits by experts). A very important and often unappreciated legal doctrine is that a specification includes, as a matter of law, both any actually cited references, and also any well known art even if not cited or incorporated. The CCPA clearly restated in 1981 in In re Howarth, 654 F.2d 103, 210 U.S.P.Q. 689 at 691-2, the principle that well known art is legally a part of the specification and drawings, and does not need to be cited or described within the *per se* specification to provide legal support. "What is conventional knowledge will be read into the disclosure." 210 U.S.P.Q. 689 at 691-2. As pointed out in the treatise "Patents" by Chisum at 7.03(2): "In Webster Loom Co. v. Higgins, the Supreme Court stated that 'That which is common and well known is as if it were written out in the patent and delineated in the drawings,' and a number of lower court decisions refer to what is 'well known.' . . . The person skilled in the art under §112 should be deemed to know 'all prior art which is generally and reasonably available to the public.' The Court of Customs and Patent Appeals adopted such a standard in In re Howarth (supra). Even before In re Howarth, supra, in In re Chilowsky, 43 CCPA 775, 780, 229 F.2d 457, 460, 108 U.S.P.Q. 321, 324 (1956), the CCPA had stated at 324 as to the 35 U.S.C. §112 disclosure issue that it is well

settled that the disclosure of an application embraces not only what is expressly set forth in words or drawings, but what would be understood by persons skilled in the art. As was said in Webster Loom Co. v. Higgins et al., 105 U. S. 580, 586, the applicant 'may begin at the point where his invention begins, and describe what he has made that is new and what it replaces of the old. Controlling Federal Circuit pronouncements on several aspects of 35 U.S.C. §112 were restated in the Court's decision thereon by Judge Rich in 1986 in Hybritech Inc. v. Monoclonal Antibodies, Inc., 231 U.S.P.Q. 81, 93-94 (Fed. Cir. 1986). A claim which is understandable and which defines the subject matter which Applicants regard as their invention meets the requirements of §112; Applicants are entitled to broad claims commensurate in scope with the invention as disclosed. See In re Kamal et al., 398 F.2d 867, 158 U.S.P.Q. 320 (CCPA 1968). Accordingly, Applicants are of the position that claim 1 satisfies the requirements of §112, first paragraph and respectfully request reconsideration and withdrawal of this ground for rejection.

Further with respect to the rejection of claim 1 under §112, second paragraph, the Examiner has stated that in claim 1, line 4, after "the segment "Z", "comprises" should be changed to "is selected from" for proper Markush language. Applicants disagree with this position. The language in its present form describes the invention, and if modified as suggested by the Examiner would not adequately describe the invention. It is well settled that the term "comprises" is equivalent to the term "includes", and the language in its present form recites a compound wherein "Z" includes (but is not limited to) atoms or groups containing carbon, oxygen, nitrogen, and/or sulfur. "Z" refers not only to

atoms, but also to moieties that contain one or more of carbon atoms, oxygen atoms, nitrogen atoms, and/or sulfur atoms; see, for example, the specification at page 5, lines 5 to 9. Specific examples of "Z" in the application include -NH-, -N[$(CH_2)_yCH_3$]-, -O-, and -S-. The Examiner's statements regarding the definitions of "Z" in claims 3 and 4 are also addressed by Applicants' discussion of the language in claim 1 defining "Z". Accordingly, Applicants maintain that the present language in claim 1 clearly defines the invention for one of ordinary skill in the art, respectfully request reconsideration and withdrawal of this ground for rejection.

Additionally with respect to the rejection of claim 1 under §112, second paragraph, the Examiner has stated that claims 6 to 9 each recite the limitation of "a compound having the formula of the structure shown", that there is insufficient antecedent basis for this limitation in the claims, that in claim 1 R_1 is broadly described as "comprising a chromophore", and that the specification fails to define the term chromophore so that one skilled in the art may ascertain structures of compounds of R_1 and claims 6 to 8 thus lack antecedent basis.

Applicants disagree with this position. Claim 1 recites that R_1 comprises a chromophore that absorbs light from the visible wavelength range. At page 6, the specification states that examples of chromophores include methine, metal phthalocyanine, azamethine, azo, triphenylmethane, rhodamine, xanthene, indoaniline, pyridone, perylene, anthrapyridone, and anthraquinone. One of ordinary skill in the art would readily recognize that the moiety attached to the carbonyl

group in claims 6 and 7 is a methine chromophore. Similarly, one of ordinary skill in the art would readily recognize that the moiety attached to the carbonyl group in claims 8 and 9 is a xanthene chromophore. Accordingly, Applicants are of the position that claims 6 to 9 have antecedent basis in claim 1, and respectfully request reconsideration and withdrawal of this ground for rejection.

Concerning the objection to the claims, the Examiner has stated that in claims 1, 3, and 4 the term "the segment" is confusing with regard to the definition of "Z". Applicants disagree with this position. As stated hereinabove with respect to the definition of "Z", "Z" refers not only to atoms, but also to moieties that contain one or more of carbon atoms, oxygen atoms, nitrogen atoms, and/or sulfur atoms; specific examples of "Z" in the application include -NH-, -N($(CH_2)_yCH_3$)-, -O-, and -S-. Applicants are of the position that references to "Z" and to "Z($(CH_2)_nCH_3$" as "segment", particularly when this language is viewed in light of the specification, are clear and understandable to one of ordinary skill in the art. Accordingly, Applicants respectfully request reconsideration and withdrawal of this ground for objection.

Applicants believe that the foregoing amendments and distinctions place the claims in condition for allowance, and accordingly respectfully request reconsideration and withdrawal of all grounds for rejection. Applicants further request reconsideration of the nonelected claims upon allowance of a generic claim.

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No additional fee is believed to be required for this amendment. However, the undersigned Xerox Corporation attorney (or agent) hereby authorizes the charging of any necessary fees, other than the issue fee, to Xerox Corporation Deposit Account No. 24-0025. This also constitutes a request for any needed extension of time and authorization to charge all fees therefor to Xerox Corporation Deposit Account No. 24-0025.

In the event the Examiner considers personal contact advantageous to the disposition of this case, she is hereby authorized to call Applicant(s) attorney, Judith L. Byorick, at Telephone Number (585) 423-4564, Rochester, New York.

Respectfully submitted,

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(585) 423-4564

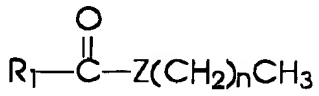
JLB/cw
January 22, 2002
Xerox Corporation
Xerox Square 20A
Rochester, New York 14644

Application No. 09/772,617

VERSION WITH MARKINGS TO SHOW CHANGES MADE:

IN THE CLAIMS:

1. (Amended) A compound having the formula:



wherein R_1, Z and the carbonyl can be comprised by a common ring, wherein R_1 comprises a chromophore that absorbs light from the visible wavelength range; wherein the segment Z comprises one or more of C, O, N and S; and wherein n is an integer that is at least [12] 17.

Claim 67 is new.